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ABSTRACT

A variety of pressures from students, alumni, legislators, and administrators has led to increasing concern about the quality of college instruction. In education and psychology, innovation frequently involves either the development of more precise behavioral approaches or more humanistics approaches; yet innovation often occurs without systematic consideration of broad goals and purposes. Failure to analyze goals and purposes lead too easily to fragmentary conceptions of how instruction should be planned, implemented, and evaluated. The Learner Controlled Instruction (LCI) approach attempts to define broad goals and to use an adaptation of Glaser's Basic Teaching Model to provide a framework for instructional design and evaluation. The learner assumes considerable autonomy in deciding what and how to learn and in evaluation; he has responsibility, however, for clarifying his goals and intentions and communication with the instructor. The goals and purposes of LCI are examined in relation to the cognitivee and affective taxonomies, Torrance's definition of creativity, and Parnes' creative problemsolving model. A variety of criteria are described for evaluating instructional innovations in three categories: basic psychological aptitudes and traits; student report data; and internalization and application criteria. (Author)

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Instructional Innovation: For What? For Whom? And How Do We Know?[1]

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People seem to be getting more and more concerned about the quality of instruction at the college level. Our students, once docile and submissive, are aggressive and active about the quality of teaching. Those who make decisions about merit, promotion, and tenure are facing increasing pressures for systematic evaluation of teaching. New emphases on "accountability" inevitably include some concern for the quality of instruction. These pressures and concerns could provide impetus for the rejuvenation and re-direction of higher education, which some predict is urgently needed for institutional survival (e.g., Freedman and Sanford, 1973). More realistically, however, we seem most often merely to be "tinkering" with bits and pieces of the structure, trying to add a support here or a patch there.

For those of us in education and psychology, common changes have involved movement in a direction toward either more "humanistic" instruction or toward new and sophisticated behavioral approaches. In some part, at least, movement in the former direction seems often to be associated with increased concerns for student needs and interests, the student-centered curriculum, and what we might call the rhetoric of personal relevance or significance. On the other hand, movement towards more behavioral orientations appears to be more responsive to the current wave of concern for accountability and the impact of modern technology.

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Neither direction, involving extremes at either end of the scale as well as more "moderate" interventions, seems to result from a systematic, planful examination of the broad goals of higher education. Nor have we examined the kinds of instructional decisions necessary to foster progress toward the attainment of broad educational goals. We really have not asked the very fundamental questions, "Why are we teaching, anyway?" and "What does that have to say about how we are teaching?"

Our lack of attention to goals and purposes increases the chance for us to be swept along in one current or another in our general orientation. It also allows us to pursue isolated or fragmented conceptions of how to go about implementing change in the actual conduct of instruction.

Without a keen sense and concern for purpose, we may drift rather easily from the incorporation of one novel strategy to another in our teaching, or perhaps even worse, pick up bits and pieces from here and there with very little sense of whether our effort has any potential value for getting us where we wanted to go. More than a decade since its origin, Robert Mager's Sea Horse Fable, from 1962, still seems to serve good warning upon us! Once educators were aglow over the potential of programmed instruction, but taps have been sounded (Feldhusen, 1963). Now it is modular instruction, mini-courses, CAI or audio-tutorial; one cannot help but wonder if anyone has asked, "Why?" Lectures aren't as popular anymore as when I was an undergraduate, and now we all tend to see more films, and literally to play more games, to micro-teach and to define the minimum competencies which are requisite for our students.

I hope you will not misunderstand me. I have no special axes to grind about these things. Movies, micro-teaching, mini-courses, and the like, and maybe even the old standard lecture, aren't the villains here; for generally, they are

not inherently "good" or "bad." But we seem to have become the villains, when we lurch out of one kind of instruction and into another without knowledge, or even much concern, about what we're trying to accomplish or how our methods and procedures might help or hinder us in reaching the goals for which education exists.

Finally, we have been "tinkering" recently with a variety of evaluation models. We all have heard about a full range of "techniques"--from "testing is for the birds--no more tests--everybody gets an A" to "set the standards in advance, and take the tests over until you reach the standard." We have seen self-evaluation, norm-referenced-evaluation, criterion-referenced evaluation, personal growth, and non-evaluation. If it sounds confusing, pause to consider the plight of today's undergraduate who has, no doubt, lived through most all of these--and perhaps through several in any given semester.

I suppose it is obvious by now, but my thesis is that we should not be innovating in college instruction for reasons like these. We ought not be operating so mindlessly, so carelessly, or perhaps not quite so fashionably. We ought not be viewing instructional innovation as an end in itself, and, I think, we must exercise some caution in the university so that the mere act of innovation doesn't become self-rewarding.

Let me attempt to illustrate an alternative. It's yet a small program, not a major national thrust, and not daily in the eye of the public. It may thus be presumptuous to use it this way. I offer it only to illustrate one way in which some of us are seeking to change our own efforts more systematically. At Purdue, I began working a few years ago with Kent Davis on an approach we've consistently called LCI for "Learner Controlled Instruction." Since I moved to Kansas, Kent and I have continued our work by mail, through occasional

visits, and with our students, and some K.U. colleagues have also joined the venture. The entire framework is yet evolving, rather than static and existant, and so we should really speak of what we're trying to do, rather than what we did.

First of all, we are concerned with articulating a set of goals and purposes to serve as general indicators of what we believe instruction should seek to accomplish. We have stated these goals in the form of a series of questions (Treffinger and Davis, 1971), broadly derived from a familiar model of instruction (Glaser, 1962), and also in much briefer form, as a set of general propositions about the purposes of instruction (Treffinger, 1973). These propositions are stated in Table 1.

Even though we may depart from tradition by beginning with the question of purpose as viewed by the learner rather than the teacher, we believe that these general propositions would ordinarily be considered worthwhile purposes, and that they are consistent with the goals that are generally expressed and supported for higher education. We believe, then, that there is "face validity" for the purposes we have described. In addition, we believe that, under examination using several approaches or models of instruction, our purposes would also be regarded as plausible and desirable outcomes.

We have attempted to incorporate psychological knowledge about learning, development, and instruction, from both experimental and humanistic traditions into a new model, in which components which are compatible and mutually supportive have been synthesized.

In developing and defining instructional procedures, we have looked at these purposes, and attempted to plan options for learners which will provide many different opportunities or paths for the learner to attain the goals. Acquisition

of content has not been sacrificed in this effort, although it has assumed a secondary role. In fact, we may have leaned in the direction of being even less "prescriptive" of content than we might have been without having to sacrifice the orientation which begins with the student. We have sought generally to develop our approach consistently with a psychological rationale for instruction Feldhusen and I presented earlier (Feldhusen and Treffinger, 1971), although an alternate approach recently described by Feldhusen et al. (1973) probably attempts to establish an even closer correspondence. In moving from the stage of considering purposes to designing procedures, we have dealt with several factors at once. We have had to ask both: "What do we know about the psychological background and rationale for certain instructional procedures?" and "Among the many procedures available, which can most effectively facilitate progress toward the attainment of the general goals?"

Emphasis has been on the creative, independent inquiry of the learner, stressing self-direction which begins with the selection or development of objectives and continues throughout the instructional episode. This emphasis is clear in our statement of purposes, which can be related rather easily to the phases of Torrance's (1966) definition of creative thinking or Parnes' (1967) formulation of the creative problem solving process. We are also concerned with affective outcomes (Krathwohl, 1964) as well as several levels of cognitive outcomes (Bloom, 1956). Table 1 summarizes our statement of purpose and illustrates relationships with each of these additional models.

From the statement of purposes for LCI, and with utilization of other supporting psychological theory and research, we feel that it should be possible to develop a more systematic approach to instructional innovation, to examine

closely the suitability of alternative instructional procedures, and to develop hypotheses about strategies for meeting more effectively the needs of many different learners.

We are also concerned with the problem of evaluation. How do we decide whether or not a particular innovation in instruction is worth being used? Does it really accomplish what it purports to do? Does it serve those purposes more effectively than might be accomplished using some other approach? For what students does it have the greatest (or least) appeal and effect? These are very difficult questions; unfortunately, we do not yet have very complete answers for them.

One of the most difficult problems, of course, has to do with the identification of appropriate criteria for answering such questions. It is very clear, as supported in the extensive study reported by Dubin and Taveggia (1968), that we will not be able to get the information we need from students' scores on such course achievement measures as final examinations. Dubin and Taveggia, who surveyed studies of the effectiveness of various teaching methods, as reported over a period of some four decades, concluded that, when the utility of a method is assessed through final course exami nations, there are in general "no differences that amount to anything." (1968, p.8). Such achievement measures also seem to be inappropriate to use for the evaluation of an instructional approach in which the acquisition of a fixed body of content for all students is not a principal outcome.

It seems necessary, instead, to begin with the statement of goals and purposes. This would facilitate identification of evaluation criteria for assessing the effectiveness of the approach.

It is very easy to fall into a little trap at this point, however. On the one hand, we may accept the assertion that the usual student achievement indices will not be adequate for evaluation. But, on the other hand, the more closely we tailor our evaluation criteria to a particular model of instruction, the more we may be subject to the criticism that we cannot use those criteria very generally, or for comparisons of instructional methods. It does seem to be a hollow victory, in that sense, to establish that method X is superior to method Y in relation to an outcome which only method X ever purported to develop in the first place.

This apparent delemma can be resolved, however. First of all, we might observe that our intention should seldom be to compare two methods per se, in any event. Not only are such "John Henry" comparisons unlikely to produce consistent significant results, but they are also unlikely to provide much information we can use in improving instruction. Whatever useful data are sought are also frequently confounded by complex aptitude treatment interactions which have seldom led to clear, implementable prescriptions for individualizing instruction.

Secondly, when we have carefully specified and analyzed our purposes and goals, the aim of evaluation is to help us make better decisions about how to reach those goals. Thus, I concur with Stufflebeam et al. (1971) that we must distinguish more carefully between research and evaluation in education. In evaluation of instructional innovations, I believe we should be primarily concerned with information that will help us to determine whether we are successful in reaching our goals, and to locate areas in which changes or improvement are needed. Research concerning the relative effectiveness or differing consequences of two or more methods or procedures may also be very important, but

it represents a much different problem. With these purposes for evaiuation, it is appropriate that the criteria should be selected on the basis of their usefulness in relation to the goals and purposes of the specific instructional approach. Our question thus becomes, "What criteria will provide evidence that we can use to make better decisions about our ability to attain the goals and purposes?"

As a tentative response, I shall propose three general categories of evaluation criteria for innovative instructional approaches: (1) basic psychological aptitudes and traits; (2) student reports; and (3) internalization and application. These are summarized in Table 2.

Criteria in level one, basic psychological aptitudes and traits, are concerned more specifically with the question, "Has the learner changed, as an individual, in predicted ways?" In this category, we are concerned with using our analysis of goals and purposes to formulate in advance specific hypotheses about the development of certain fundamental cognitive abilities or personal characteristics of the learner. In our LCI approach, for example, we would make predictions concerning the development of specific aptitudes and traits related to creative thinking, independent inquiry, and problem-solving, as illustrated in Table 2. These variables are often readily defined operationally, because of their limited scope. An obvious difficulty involved at this level, of course, is that the fundamental aptitudes and traits may not be able to be interpreted, or translated, directly into specific principles for instructional design or revision. Our efforts to formulate hypotheses about such fundamental psychological variables may have substantial value, however, in studying individual differences or trait-treatment interactions.

Criteria in level two, student reports, include two fundamental sub-divisions: student indications of attitudes or preferences in relation to the methods or content and assessment of student acquisition of specific content. In this category, we are concerned with the development of the learner's attitudes and preferences, in relation to the purposes of instruction, and with the learner's knowledge in relation to the instructional objectives which comprise the content of the course. Student ratings of courses and instructors are always problematic, of course. The assumptions about instruction which are frequently "built in" to most standardized rating scales may be especially detrimental to obtaining useful data for evaluating innovative approaches. Nonetheless, we should be concerned about the students' feelings and preferences for our methods and for the content with which they have worked, and the value of such data should not be dismissed too lightly. We may need, therefore, to develop student attitude or preference inventories which represent adequately the parameters of the instructional model being employed.

In most instructional programs, we generally assume that the learner does acquire some content, and we usually attempt to foster more complex kinds of learning and thinking than merely recognition and recall. Given that such intentions are incorporated in our goals and purposes, it is necessary to include assessment in these areas as part of our evaluation of the approach. (It is not necessary, of course, to relate this assessment to the question of assignment of grades to students.) If our goals and purposes propose that students should have opportunities for application, analysis, synthesis, and evaluation, as well as for knowledge and comprehension, it does follow that we should seek some evidence that these complex outcomes have been reached, as we attempt to establish the effectiveness of the approach.

Criteria in level three are described as internalization and application criteria. These criteria deal, in the most general sense, with the competence of the learner in relation to the goals and purposes of instruction. We are concerned with the student's personal recognition and acceptance of the goals and purposes, and with the student's ability to demonstrate proficiency outside our classroom and beyond the contrived environment of tests, course assignments or projects, and ratings. From the most practical point of view, we have not accomplished very much if we have only produced incompetent students who are fluent on paper and who "enjoyed" our course. Beyond this, I am certain, we want to believe that they have grown, and that they can now cope more effectively with their "real world" and its problems. But how can we tell?

It would be appropriate, I suppose, for us in educational psychology, to base our evaluation upon some evidence that a person, as a result of our instruction, solves problems more effectively in an actual teaching situation. But to collect such data, or to presume that we could attribute what we observed to our instruction, seems improbable as we operate today. As a result, we have had to retreat from the student's "real world" to attempts to simulate that world. The use of micro-teaching, for example, often accompanied by video-taped performances which can be reviewed and critiqued, has become a popular method for determining whether the student has increased in actual competence. This method is time-consuming, however, and requires space and equipment not always readily available. In addition, it focuses most often on the acquisition and demonstration of highly specific skills, such as questioning strategies, or reinforcement techniques, and thus does not really create a problem situation for the student.

We need to develop simulated problem-solving situations, which can be related

to the student's personal course of study during the course of instruction. These should be selected by the student, and presented in a form which does not require special space or equipment. The presentation must be sufficiently "open" to give the student control, but sufficiently programmatic to sample adequately all aspects of the instructional goals and purposes. There must be many possible courses of action and solutions, with mechanisms for providing new input as the problem progresses. We must be able to obtain information from the student about his choices and decisions, the steps he takes throughout the problem, the strategies he employs, as well as his solution or "exit" from the problem. Preliminary work from the Berkeley Creativity Project (Olton, et al., 1967; Covington, in press) and from the work of one of my students (Speedie, 1973) suggests that we can develop programmed" approaches to the assessment of problem solving with elementary school students. Our next task is to extend this work to problems which are relevant for college students in our LCI courses; we are currently beginning such an effort.

Charles Silberman, in his piercing Crisis in the Classroom (1970) has proposed that one of the greatest problems confronting American education, at every level, is "mindlessness." We should be sensitive to this problem as we develop innovative approaches to instruction. We must devote considerable effort to the formulation and analysis of goals and purposes, which provide us the essential foundation for the development of instructional procedures and for the identification of new and more adequate criteria for evaluation.

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Table 1

Goals and Purposes of LCI: Description and Analysis

Purposes of LCI	Relation to Cognitive and Affective Taxonomies	Relation to Torrance Definition of Creative Thinking	Relation to Parnes Creative Problem Solving Model
<u>Providing an environment for growth</u> -containing resrouces (people, things, time, space); -fostering trust, encouragement, support (psychological safety).	Awareness Willingness to receive willingness to respond satisfaction in response	Becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies	Fact finding
<u>With opportunities to learn to</u> -identify personal needs and goals -relate goals to the instructional domain -develop plans to reach goals, satisfy needs	Knowledge, comprehension, analysis, synthesis	Identifying the difficulty.... Searching for solutions, making guesses, formulating hypotheses	Problem finding Idea finding
-carry out those plans, using appropriate resources and strategies -make decisions and judgments -use information and solutions -formulate new problems and challenges	Comprehension, application, analysis, synthesis Evaluation Aplication, synthesis	Testing and retesting the hypotheses, with possible modifications Communicating the results	Idea finding and solution finding Acceptance finding
<u>And to learn to recognize and respond to</u> -one's own physical, personal and emotional traits -resources, problems, goals and needs of other people -problems, resources, and needs of a changing world and society.	Receiving Responding Valuing	(Identifying difficulties, searching for solutions, Communicating results)	Problem finding, solution finding and Acceptance finding

Table 2

Criteria for Evaluating Instructional Innovations (with illustrations for LCI)

Level I: Basic Psychological Aptitudes and Traits

Underlying psychological abilities and characteristics which are related to the attainment of goals and purposes.

I-A: Cognitive Aptitudes (Creative thinking abilities; structure of intellect abilities involving: cognition, divergent production, and evaluation of semantic and behavioral products)

I-B: Personal Characteristics (self-actualization; independence in thought and judgment; internal locus of control; self-confidence)

Level II: Student Reports

Student ratings of attitudes and preferences for methods and content and indices of student attainment of specific instructional objectives.

II-A: Student ratings (student attitudes towards course environment and resources, instructor's assistance and support. opportunities for self-direction of learning, relevance of instructional material and resources to student objectives)

II-B: Attainment of Objectives (projects, papers, and reports demonstrating accomplishment in relation to specified objectives at several levels. including application, analysis, synthesis, and evaluation as well as basic knowledge and comprehension)

Level III: Internalization and Application

Evidence that the student has accepted for himself the goals and purposes, and demonstration of the student's competence outside the instructional setting.

III-A: Observation in Natural Settings (Observation of the student's application of learning in solving problems confronted in an actual teaching situation)

III-B: Simulation of Problem Situations (Opportunities to observe and evaluate student competence in self-management of learning and problem-solving under laboratory conditions which realistically approximate actual teaching experiences).

III-C: Measures of Problem-Solving (Student's performance on measures which stress application of knowledge and skills in complex tasks rather than recall or recognition alone.)